

REMARKS

The Examiner is thanked for the due consideration given the application.

Claims 1, 2 and 4-21 are pending in the application. Claim 3 has been canceled and its subject matter has been generally incorporated into claim 1. Claims 8-21 are newly presented. Support for new claims 8 and 9 can be found in the specification at page 9, line 18 to page 10, line 6. New claims 10-12 find support in the specification at page 14, lines 6-12. New claim 13 finds support in the specification at page 15, lines 2 to 4. New claim 14 finds support in the specification at page 15, lines 22-25. New claims 15 and 16 find support in the specification at page 16, lines 1-27. New claims 17 and 18 find support in the specification at page 17, lines 13-21. New claim 19 generally sets forth subject matter found in claims 1, 8 and 13. New claim 20 generally corresponds to claim 3. New claim 21 generally corresponds to claim 9.

No new matter is believed to be added to the application by this amendment.

Objection to Claim 3

Claim 3 has been objected to as containing informalities. Claim 3 has been canceled, thus rendering this objection moot. Claim 1, which incorporated the subject matter of claim 3, is believed to be free from informalities.

Rejection Under 35 USC §103(a)

Claims 1-7 have been rejected under 35 USC §103(a) as being unpatentable over KASUYA et al. (J. Phys. Chem. B, Vol. 106, No. 19 (2002) pp. 4947-4951) in view of IIJIMA et al. (Chemical Physics Letters,, Vol. 309 (1999) pp. 165-170). This rejection is respectfully traversed.

The present invention pertains to a method of forming carbon nanohorns that is illustrated, by way of example, in Figure 1 of the application, which is reproduced below.

FIG. 1

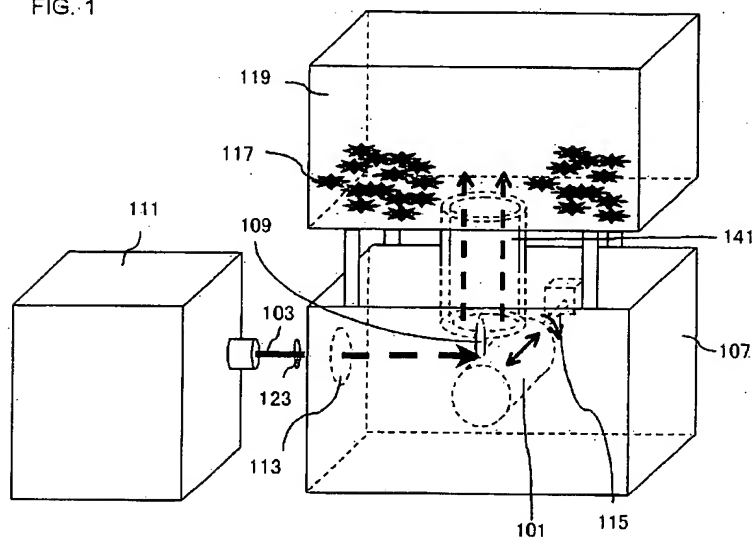


Figure 1 shows a graphite target (rod) 101 that is rotated at a constant speed while being pulsed with a laser beam 103. Claim 1 of the present invention recites a ratio relationship: "a condition of irradiation with said pulse light satisfies expression (1):

$0.5 \leq (\text{pulse width})/(\text{pulse width} + \text{pause width}) \leq 0.8$
(1)."

KASUYA et al. pertain to the production of single-wall carbon nanohorn aggregates. The paragraph bridging pages 4947 and 4948 of KASUYA et al. discusses laser vaporization of a graphite rod at a pulse width of 500 ms (but see new claim 19).

KASUYA et al. fail to disclose a ratio relationship of $0.5 \leq (\text{pulse width})/(\text{pulse width} + \text{pause width}) \leq 0.8$, such as is set forth in claim 1 of the present invention.

The Official Action acknowledges that KASUYA et al. is silent to the step wherein an irradiation position of the pulse light is moved at substantially constant speed when the surface of the graphite target is irradiated with the pulse light. The Official Action refers to IIJIMA et al., which at page 166, first column, line 14 discuss rotating a graphite rod at 6 rpm. However, this teaching of IIJIMA et al. fails to address the above-discussed deficiencies of KASUYA et al.

Regarding claim 3 (now incorporated into claim 1), the Official Action asserts that specific conditions in the paragraph bridging pages 4947 and 4948 of KASUYA et al. fulfill the claimed ratio.

However, extrapolating a mathematical relationship from raw data has been found to be impermissible. See *Harries v. Air King Products Co*, 183 F.2d 158, 86 U.S.P.Q. 57 (2d Cir. 1950).

In *Harries*, the length and width of an electron stream in an electron tube were used to extrapolate a ratio, even though the specification did not once mention the ratio of the length of the electron stream to its cross section. Judge Learned Hand found: "We hold that the original specifications were for long streams, regardless of the ratio of length to cross-section, because the ratio was a later and unauthorized interpolation into the application as originally filed." 183 F.2d at 159. Judge Learned Hand additionally stated:

Even though it were possible that a person skilled in the art might see that it was not absolute length, but the ratio of length to cross-section that was important, we should not be justified in validating such an expansion of the original; it is the sort of artful extrapolation against which courts have over and over set their faces. 183 F.2d at 160.

Therefore, even if the values set forth in KASUYA et al. satisfy the ratio set forth in claim 1, the mere existence of these values is insufficient. "The mere fact that a certain thing may result from a set of circumstances is not sufficient." *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949 (Fed. Cir. 1999).

Therefore, one of ordinary skill and creativity would fail to produce claim 1 of the present invention from a knowledge of KASUYA et al. and IIJIMA et al. A *prima facie* case of unpatentability has thus not been made. Claims depending upon claim 1 are patentable for at least the above reasons.

This rejection is believed to be overcome, and withdrawal thereof is respectfully requested.

New Claims 8-21

New claims 8-21 have been presented for prosecution on the merits. It is believed that new claims 8-21 are instantly patentable over the cited art.

Conclusion

The Examiner is thanked for considering the Information Disclosure Statement filed November 2, 2005 and for making an initialed PTO-1449 Form of record in the application.

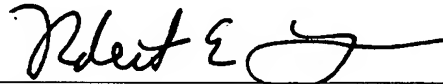
Prior art of record but not utilized is believed to be non-pertinent to the instant claims.

The objections and rejections are believed to have been overcome, obviated or rendered moot and no issues remain. The Examiner is accordingly respectfully requested to place the application in condition for allowance and to issue a Notice of Allowability.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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